



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,183	02/16/2001	Takeshi Tsuzuki	108390-000012	3094

7590

03/23/2004

ARENT FOX KINTNER  
PLOTKIN & KAHN, PLLC  
Suite 600  
1050 Connecticut Avenue, N.W.  
Washington, DC 20036-5339

EXAMINER

JACKSON, JAKIEDA R

ART UNIT	PAPER NUMBER
----------	--------------

2655

H

DATE MAILED: 03/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/784,183

Applicant(s)

TSUZUKI, TAKESHI

Examiner

Jakieda R Jackson

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Specification*

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the novelty in the invention to which the claims are directed.

### *Claim Objections*

2. **Claim 2** is objected to because of the following informalities:

In **Claim 2**, the undefined acronym SMR should be written as --Signal to Mask Ratio (SMR)--, this being the first claim that "SMR" appears in.

Appropriate correction is required.

### Comments on Claim Rejections

3. **Claims 1-22** are written sufficiently broadly that an obvious variation of the usual way of assigning bits in perceptual speech coding, based on the SMR of each subband (with this SMR vs bits being stored in a bit allocation table) will read on the recited subband bit allocation scheme. Except that applicant has tables (plural), so that for a given SMR there would be more than one set of possible bit allocations, each set of SMR vs bits being in a separate table. It would have been obvious to one of ordinary

skill in the art at the time the invention was made to have several SMR versus bit tables, each set having successively more or less bits allocated, as alternatives for continuing to loop through subband bit allocations in a frame when the number of total bits for the frame (allocated subband bits summed over the subbands) is either too small or too large, respectively, so as to fine-tune the process.

Though applicant wants to "eliminate the necessity to perform the loop process" (Abstract), implying that a single pass bit allocation process is supposed to be the novelty, claims 6-9 and 17-20 are directed to a looping process, which looping, as recited, is not guaranteed to automatically stop at the second iteration.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-3, 12-14** are rejected under 35 U.S.C. 102(b) as being anticipated by Bolton et al. (U.S. Patent No. 5,761,636), hereinafter referenced as Bolton.

Regarding **claims 1 and 12**, Bolton discloses a bit allocation apparatus and method for adaptively allocating quantization bits (quantizer; figure 1, element 105) to

one or more subbands (per subband; column 3, lines 9-27) in encoding data (column 1, lines 4-50), said apparatus comprising:

a table storage section storing a bit allocation table (table of bit allocation per subband) that associates the sound information amount of an audible sound with a bit allocation count (column 3, lines 9-16); and

a bit allocation section (bit allocation element; figure 1, element 104) for allocating quantization bits (quantize number of bits) to said one or more subbands (per subband; column 3, lines 9-27) on the basis of said sound information amount of said audible sound being input (audio; column 2, lines 48-50 and column 4, lines 12-14) and said bit allocation table stored in said table storage section (table; column 3, lines 9-14).

Regarding **claims 2 and 13**, Bolton discloses an apparatus and method wherein said sound information amount of said audible sound is a Signal to Mask Ratio (SMR; column 3, lines 9-14).

Regarding **claims 3 and 14**, Bolton discloses an apparatus and method wherein said table storage section (table) stores bit allocation tables having different contents (psychoacoustic model, compression ratio and other bit allocation parameters; column 3, lines 9-14), and

said bit allocation section (104) allocates quantization bits (quantize number of bits) to said one or more subbands (per subband; column 3, lines 9-27) by selectively using one of said bit allocation tables (column 4, lines 6-13) in accordance with an encoding condition (column 1, lines 4-50).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 4-7 and 15-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolton in view of Shimoyoshi et al. (U.S. Patent No. 5,623,557), hereinafter referenced as Shimoyoshi.

Regarding **claims 4 and 15**, Bolton discloses a bit allocation apparatus and method wherein

said table storage section (table) stores bit allocation tables having different contents (psychoacoustic model, compression ratio and other bit allocation parameters; column 3, lines 9-14), and

said bit allocation section (104) allocates quantization bits (quantize number of bits) to said one or more subbands (per subband; column 3, lines 9-37) but lacks adaptively switching bit allocation tables.

Shimoyoshi teaches adaptively switching bit allocation tables (figure 2, element 108), which suggests switching bit allocation tables.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bolton's invention such that it adaptively switches bit allocation tables to use a variable number of bits effectively.

Regarding **claims 5 and 16**, Bolton discloses a bit allocation apparatus and method but lacks wherein said bit allocation section selects a bit allocation table to be used first out of said bit allocation tables in accordance with an encoding condition.

Shimoyoshi discloses the apparatus and method wherein said bit allocation section (bit allocation calculation; figure 4, element 406) selects a bit allocation table (table; fig. 4, element 409) to be used first (table 2 written in the table memory) out of said bit allocation tables (tables 1, and 3-6) in accordance with an encoding condition (column 7, lines 39-45), to assign the appropriate table to allocate the bits.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bolton's invention such that the bit allocation section selects a bit allocation table to be used first out of said bit allocation tables which allows the number of bits required for encoding to be calculated with a smaller volume of arithmetic-logical operations to contribute to speedup and cost reduction of process simplification (column 2, lines 18-24).

Regarding **claims 6 and 17**, Bolton discloses an apparatus and method wherein said table storage section (table) stores bit allocation tables having different contents (psychoacoustic model, compression ratio and other bit allocation parameters; column 3, lines 9-14) but lacks wherein said bit allocation section allocates quantization bits to said one or more subbands by using a first bit allocation table selected out of said bit

allocation tables, changes said first bit allocation table to a second bit allocation table in accordance with the total number of quantization bits allocated to each subband, and re-allocates quantization bits to each subband.

Shimoyoshi discloses the apparatus and method wherein said bit allocation section (406) allocates quantization bits to said one or more subbands (sub-band coding (SBC); column 3, lines 40-44) by using a first bit allocation table selected (table 2) out of said bit allocation tables (table 1 and 3-6), changes said first bit allocation table (table 2) to a second bit allocation table (table 1) in accordance with the total number of quantization bits allocated to each subband, and re-allocates quantization bits to each subband (column 7, lines 39-45 and figures 5-6), to adaptively allocate bits.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bolton's invention wherein said bit allocation section allocates quantization bits to said one or more subbands by using a first bit allocation table selected out of said bit allocation tables, changes said first bit allocation table to a second bit allocation table in accordance with the total number of quantization bits allocated to each subband, and re-allocates quantization bits to each subband which allows the number of bits required for encoding to be calculated with a smaller volume of arithmetic-logical operations to contribute to speedup and cost reduction of process simplification (column 2, lines 18-24).

Regarding **claims 7 and 18**, Bolton discloses a bit allocation apparatus and method but lacks wherein said bit allocation section allocates quantization bits by using said second bit allocation table which has been set such that the total number of



quantization bits allocated is smaller than that with said first bit allocation table, when the total number of quantization bits allocated by using said first bit allocation table is larger than a predetermined value.

Shimoyishi discloses an apparatus and method wherein said bit allocation section (406) allocates quantization bits by using said second bit allocation table which has been set (pre-set number of available bits) such that the total number of quantization bits allocated is smaller (processing comes to a close) than that with said first bit allocation table when the total number of quantization bits allocated (adjust the number of allocated bits) by using said first bit allocation table is larger than a predetermined value (will not exceed the number of available bits; column 5, lines 25-32 and 60-67), to obtain the number of bits need for encoding

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bolton's invention wherein said bit allocation section allocates quantization bits by using said second bit allocation table which has been set such that the total number of quantization bits allocated is smaller than that with said first bit allocation table when the total number of quantization bits allocated by using said first bit allocation table is larger than a predetermined value which allows the number of bits required for encoding to be calculated with a smaller volume of arithmetic-logical operations to contribute to speedup and cost reduction of process simplification (column 2, lines 18-24).

8. **Claims 8-9 and 19-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolton in view of Shimoyoshi in further view of Mitsuno et al. (U.S. Patent No. 5,590,108), hereinafter referenced as Mitsuno.

Regarding **claims 8 and 19**, Bolton in view of Shimoyoshi discloses a bit allocation apparatus and method but lacks wherein said bit allocation section allocates quantization bits by using said second bit allocation table which has been set such that the total number of quantization bits allocated is larger than that with said first bit allocation table, when the total number of quantization bits allocated by using said first bit allocation table is smaller than a predetermined value.

Mitsuno discloses an apparatus and method wherein said bit allocation section (figure 2, element 18) allocates quantization bits by using said second bit allocation table which has been set such that the total number of quantization bits allocated is larger than (number of bits allocated is increased) that with said first bit allocation table when the total number of quantization bits allocated by using said first bit allocation table is smaller than a predetermined value (less than the total number of usable bits; column 12, lines 20-26), to determine the ultimate bit allocation or word length.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bolton's invention wherein said bit allocation section allocates quantization bits by using said second bit allocation table which has been set such that the total number of quantization bits allocated is larger than that with said first bit allocation table when the total number of quantization bits allocated by

using said first bit allocation table is smaller than a predetermined value to prevent the sound quality from being deteriorated (column 13, lines 47-50).

Regarding **claims 9 and 20**, they recite a combination of their limitations and so are rejected for the same reasons as **claims 7-8 and 18-19**.

9. **Claims 10-11 and 21-22** are rejected under 35 U.S.C. 103(a) as being anticipated by Bolton in view of well known prior art.

Regarding **claims 10 and 21**, Bolton discloses a bit allocation apparatus and method for adaptively allocating quantization bits but lacks an apparatus and method wherein said bit allocation table has bit allocation counts set by equally dividing the range of said SMR.

However, it would have been obvious to one of ordinary skill in the art to use uniform quantization in the range of SMR (equal spacing of quantization levels in *the logarithm* of signal amplitude) because this allocates bits equally according to the ear's ability to distinguish loudness.

Regarding **claims 11 and 22**, Bolton discloses a bit allocation apparatus and method for adaptively allocating quantization bits but lacks an apparatus and method wherein said bit allocation table has bit allocation counts set by unequally dividing the range of said SMR.

However, it would have been obvious to one of ordinary skill in the art to use nonuniform quantization in the range of SMR (unequal spacing of quantization levels in

the *logarithm* of signal amplitude) to allocate bits according to equal probability of occurrence of their amplitude levels, using equal bits for equal-probability amplitude increments.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

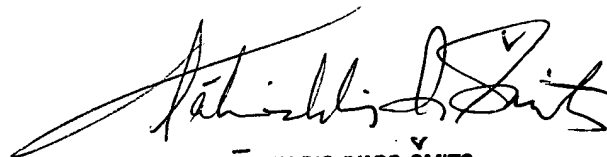
- Fiocca (U.S. Patent No. 5,625,743) discloses determining a masking level for a subband in a subband audio encoder.
- Chow et al. (U.S. Patent No. 6,408,033) discloses a method and apparatus for superframe bit allocation.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R Jackson whose telephone number is 703.305.5593. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis I. Smits can be reached on 703. 306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRJ  
March 19, 2004



TĀIVALDIS IVARS ŠMITS  
PRIMARY EXAMINER